2022 Kelp Monitoring

Introduction

In 2022 Clallam MRC continued the collaboration with the Northwest Straits Commission on the kelp monitoring project. The goal was to monitor the size and density of kelp canopies at three locations during low-tide events between July and September, 2022.

The expected outcomes were 1) to use established methods to produce georeferenced density data to be incorporated into SoundIQ, and potentially the Department of Natural Resources database; 2) to contribute georeferenced density data which can be used to evaluate longer-term trends, and support environmental decision-making.

Kelp Surveys in Freshwater Bay

Two monitoring surveys were conducted by Alan Clark, Jeff Ward, and Alisa Taylor in Freshwater Bay on July 31, 2022. The following sections provide a brief summary of the two surveys.

Large Kelp Bed

The survey of the large kelp bed east of the boat ramp was initiated at 10:12 am with a tidal elevation of -0.1 ft. and completed at 12:00 pm. The perimeter of the kelp bed was approximately 3.63 miles and the total kelp bed area was approximately 41.85 acres (Figure 1). The water temperature nearest to shore was 57°F and the water depth was 20 ft. Farthest from shore, the water temperature was 58°F, and the depth was 27 ft. The temperature monitor data which was conducted in 2021 at this kelp bed, was not continued this year; this may be continued during coming years' kelp survey seasons. Most of the area was dominated by Nereocystis leutkeana ("Bull kelp"). In previous years, Macrocystic pyrifera (Giant kelp) was present in large numbers throughout the center of the kelp bed. This year, there was little to no Macrocystis throughout the main bed. There were some isolated clumps of Macrocystis, or mixed Macrocystis and Nereocystis, in a few areas along the perimeter of the kelp bed (especially near shore), as well as some disconnected patches of Macrocystis between the main kelp bed and the shoreline. Nereocystis and Egregia menziesii ("Feather Boa kelp") mixed in the shallow areas, often extending toward the shore. Sparsely fringing Nereocystis extended significantly along the Northernmost (farthest from shore) boundary of the bed. The kelp seemed to be healthy, with many epiphytic algaes (brown & some red) and bryozoan colonies growing upon them. The area of the kelp bed was significantly smaller, when compared to previous years' surveys. There was evidence of sun bleaching on both Nereocystis and Macrocystis. Figures 2 and 3 present photos from the survey. The survey datasheets are provided in Appendix A.

Figure 1. The map of the large kelp bed at Freshwater Bay based on the field GPS readings taken July 31, 2022.

The kelp bed sizes between 2016 and 2022 are summarized in Table 1.

Table 1. Large kelp bed size between 2016 and 2022.

Date	Area (acres)
July 2022	41.85
July 2021	128.52
August 2020	112.67
July 2019	117.86
July 2018	78.0
August 2017	174.7
July 2016	141.1

Figure 2. Pictures of the large kelp bed in Freshwater Bay taken during the 2022 survey.

Figure 3. Pictures of the large kelp bed in Freshwater Bay taken during the 2022 survey.

Small Kelp Bed

The survey of the small kelp bed west of the boat ramp was initiated at 12:13 pm with a tidal elevation of 0.8 ft. and completed at 12:40 pm. The perimeter of the kelp bed was approximately 0.37 miles, and the total kelp bed area was approximately 0.78 acres (Figure 4). The water temperature nearest to shore was 62°F and the water depth was 15 ft. Farthest from shore, the water temperature was 59°F, and the depth was 27 ft. All of the area which has been consistently surveyed each year-- Southwest of Bachelor Rock-- was dominated by Nereocystis leutkeana. The kelp bed was well connected this year around the outer edge of Bachelor Rock, as well as through the gap between Bachelor Rock & the shoreline, resulting in a larger kelp bed area continuous with the thick bed of mixed Nereocystis and Macrocystis present in the bay North of the Rock. The main kelp bed, often isolated in previous years, consisted exclusively of Nereocystis. While the kelp seemed to be healthy overall, there was evidence of sun bleaching on the kelp blades. The kelp supported a plethora of red & brown epiphytic algae and bryozoans. Bachelor Rock hosts a dense colony of purple urchins, yet the vitality of the kelp in this area appears to have maintained a relative consistency. Figure 5 presents photos from the survey. The survey datasheets are provided in Appendix A.

Figure 4. The map of the small kelp bed at Freshwater Bay based on the field GPS readings taken July 31, 2022.

The kelp bed sizes between 2016 and 2022 are summarized in Table 2.

Table 2. Small kelp bed size between 2016 and 2022.

Date	Area (acres)
July 2022	0.78
September 2021	0.93
August 2020	0.64
July 2019	0.97
August 2018	1.06
September 2017	0.92
July 2016	0.71

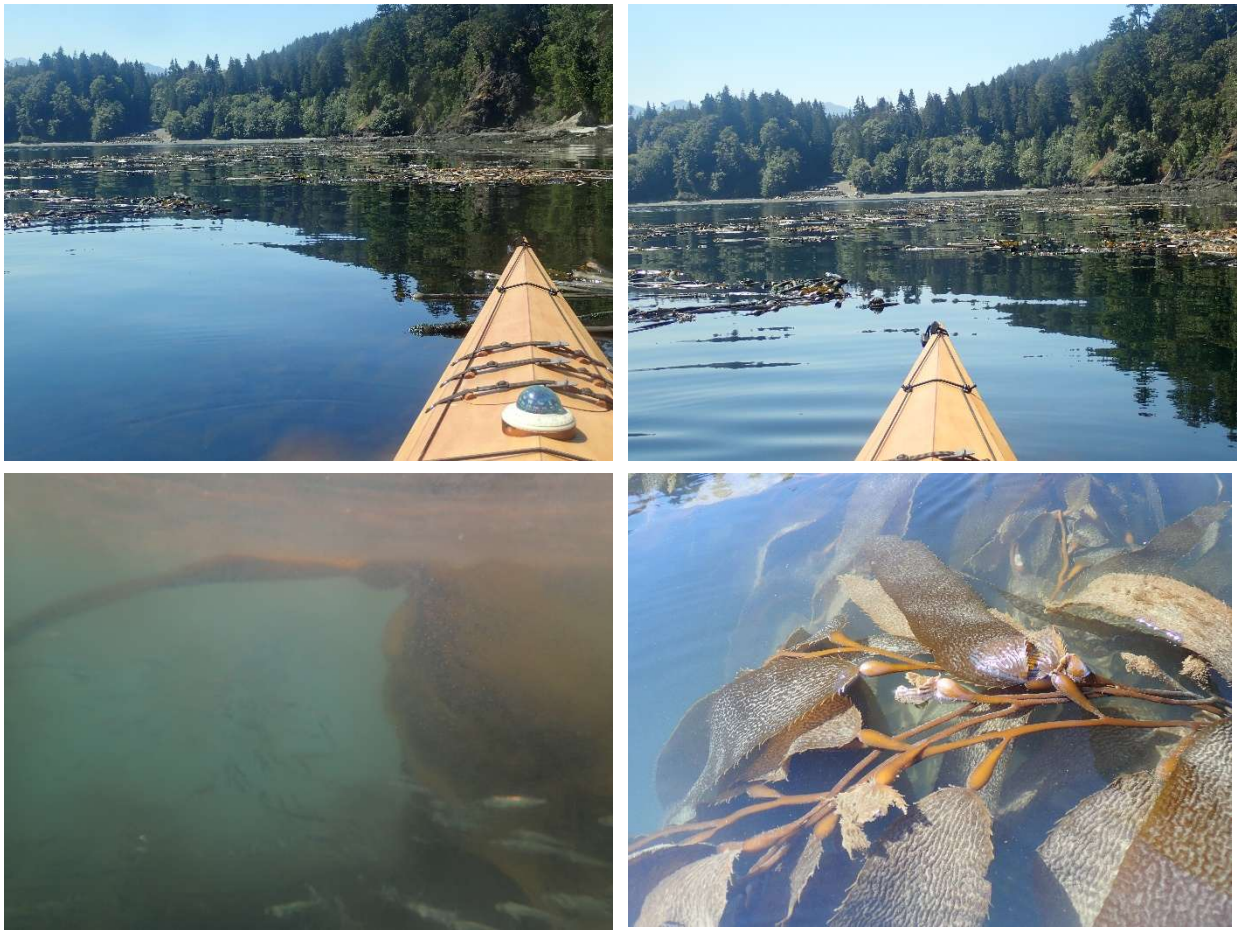

Figure 5. Pictures of the small kelp bed in Freshwater Bay taken during the 2022 survey.

Kelp Survey in Clallam Bay August 29, 2022

Two surveyors, Alan Clark and Alisa Taylor, conducted a survey of the kelp bed identified in Clallam Bay during 2016's land based reconnaissance survey. The survey was initiated at 9:20 am with a tidal elevation of 0.08 ft. and completed at 10:05 am. The perimeter of the kelp bed was approximately 1.19 miles and the total kelp bed area was approximately 12.73 acres (Figure 6). The water temperature nearest to shore was 53°F and the water depth was 6 ft; while at the point farthest from shore, the water temperature was 54° F and depth was 18 ft. The bed consisted of a mix of Nereocystis leutkeana and Macrocystis pyrifera, with Macrocystis more densely present at the center of the bed. Sparsely fringing Nereocystis extended beyond the perimeter of the main bed, especially along the Northernmost (farthest from shore) boundary. Nereocystis mixed with Egregia menziesii & Postelsia palmaeformis ("Sea Palm kelp") extended toward the shoreline along much of the Southern boundary. Along the rocks to the West was a thick patch of Nereocystis, disconnected from the main bed. The kelp bore many bryozoan colonies on their blades, as well as red & brown epiphytic algae, and there was quite a bit of eelgrass with red epiphytic algae floating among the kelp bed. The kelp seemed to be healthy overall, and quite thick & dense throughout the main bed. There was a little evidence of sun bleaching on both Nereocystis and Macrocystis. Figure 7 presents photos from the survey. The survey datasheets are provided in Appendix A.

Figure 6. The map of the kelp bed in Clallam Bay based on the field GPS readings taken August 29, 2022.

The kelp bed sizes between 2017 and 2022 are summarized in Table 3.

Table 3. Kelp bed size between 2017 and 2022.

Date	Area (acres)
August 2022	12.73
August 2021	15.32
July 2020	13.14
July 2019	22.3
July 2018	18.8
July 2017	25.1

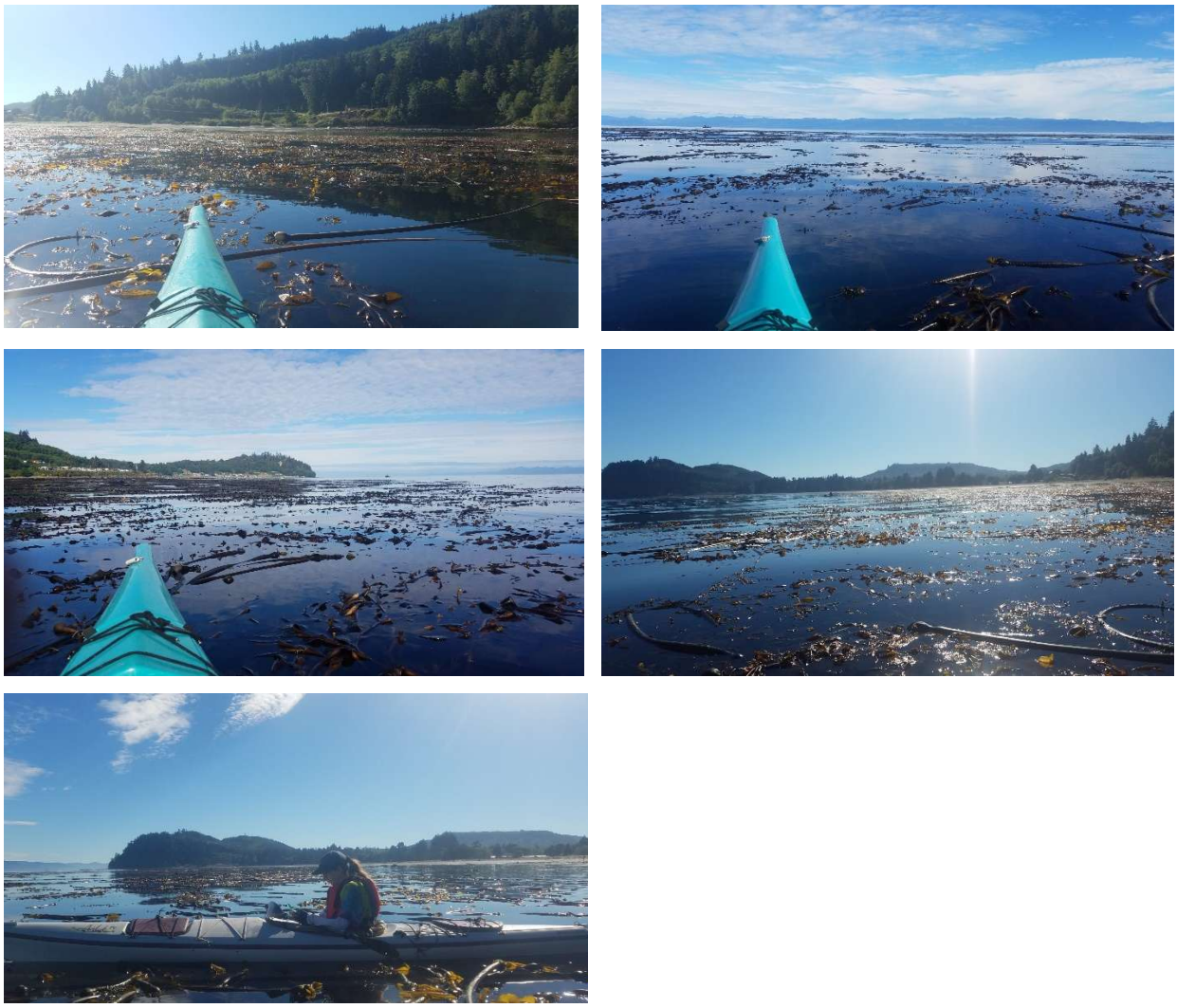

Figure 7. Pictures of the kelp bed in Clallam Bay taken during the 2021 survey.

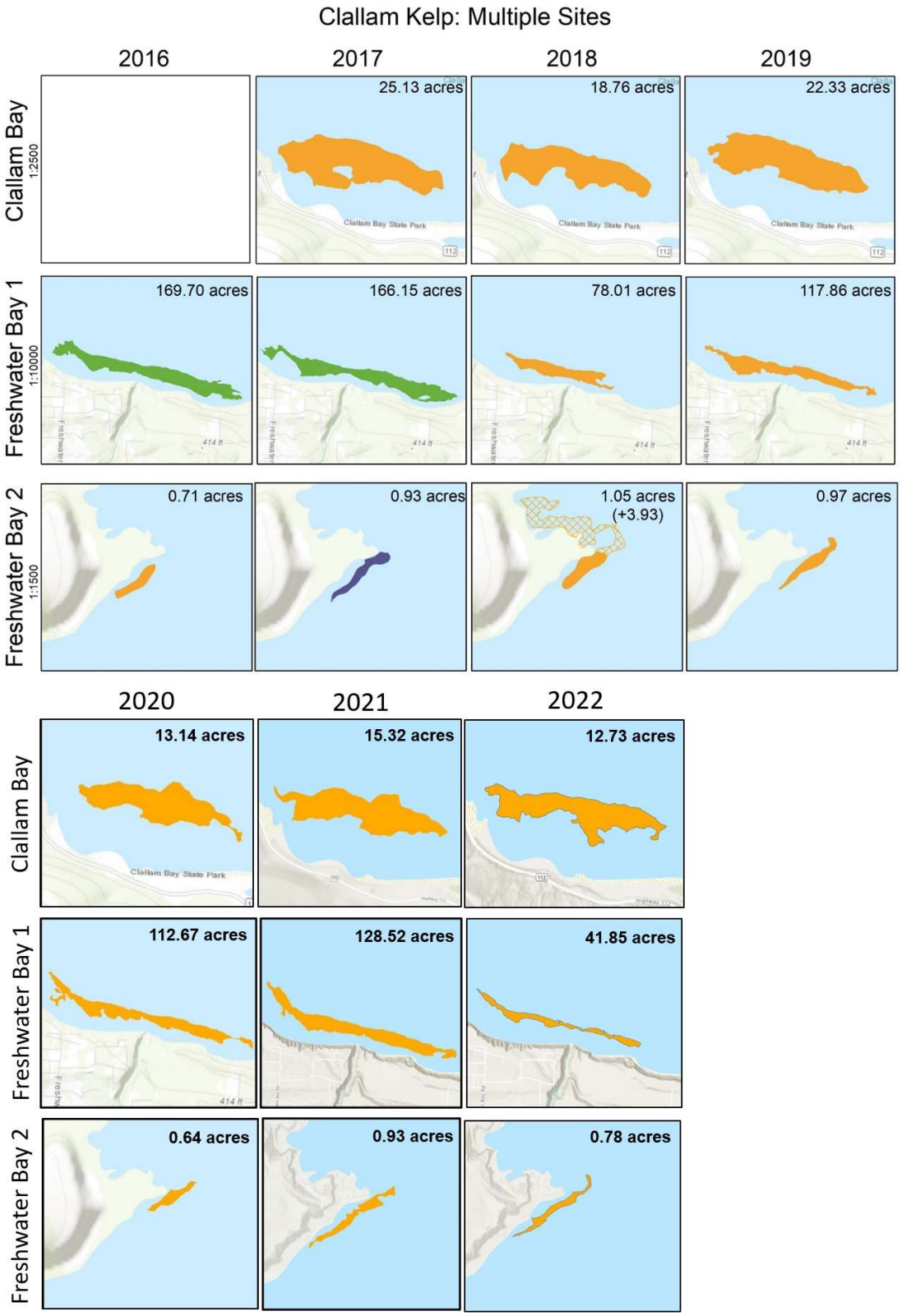

Figure 7. Area (acres) of each of the 3 Clallam County kelp beds, 2016-2022.

Appendix A – Field Data Sheets